



UNITED STATES PATENT AND TRADEMARK OFFICE

cen
UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,817	11/24/2003	Abhay Sudhakar Rao Kant	133918-1	5358

41838 7590 03/05/2007
GENERAL ELECTRIC COMPANY (PCPI)
C/O FLETCHER YODER
P. O. BOX 692289
HOUSTON, TX 77269-2289

EXAMINER

LAU, TUNG S

ART UNIT	PAPER NUMBER
----------	--------------

2863

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/720,817

Applicant(s)

KANT ET AL.

Examiner

Tung S. Lau

Art Unit

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 51, 52, 54-58 and 60-75 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 51, 52, 54-58 and 60-75 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Drawing and Specification Amendment

1. The drawing and Specification filed on 02/12/2007 has been accepted by the examiner.

1.131 affidavit

2. The evidence under 1.131 has been accepted by the examiner in the record.
The examiner reminds the applicants that the current 1.131 is not appropriate to overcome the rejection under 102(b) (see MPEP 715).

An affidavit or declaration under 37 CFR 1.131 is not appropriate in the following situation:

Where the reference publication data is more than 1 year prior to applicant's or patent owner's effective filing data. Such a reference is a 'statutory bar' under 35 USC 102(b) as referenced in 37 CFR 1.131 (a)(2). A reference that only qualifies as prior art under 35 USC 102(a) or (e) is not 'statutory bar'.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

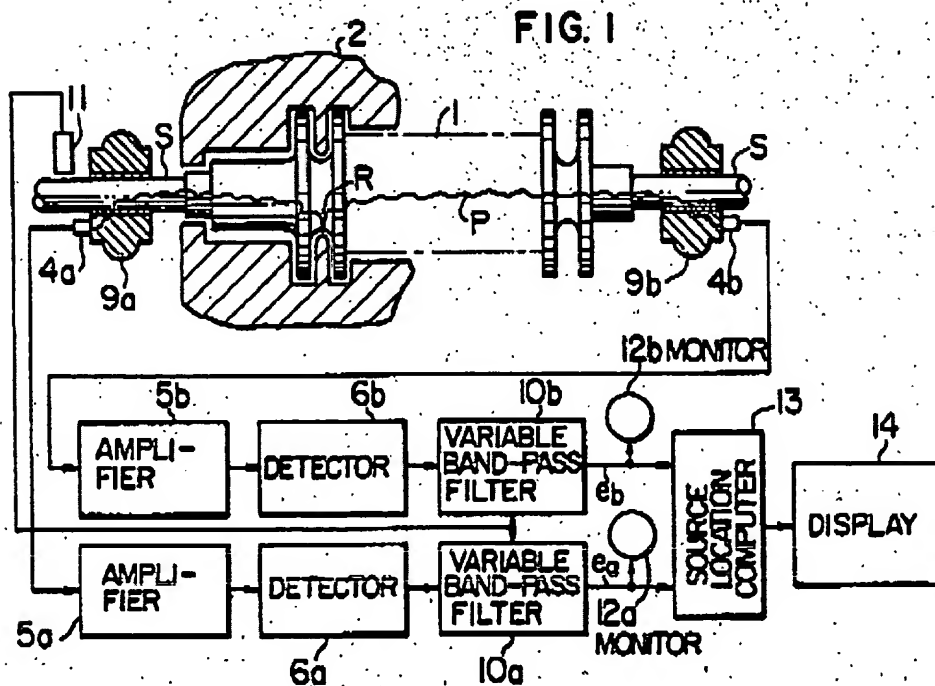
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 4, 51, 52, 54-58, 60-75 are rejected under 35 U.S.C. 102(b) as being anticipated by Sato et al. (U.S. Patent 4,478,082).

Art Unit: 2863

Regarding claim 1:

Sato discloses a system for detecting a rub in a turbomachine comprising: a turbomachine (Col. 1, Lines 35-39) comprising a rotor (Col. 2, Lines 50), a stator (Col. 2, Lines 58), and a plurality of blades extending radially from the rotor (see attachment), or the stator (Col. 2, Lines 58), or a combination thereof (see attachment); sensors (fig. 1, unit 4a, 4b) monitoring turbomachine conditions (fig. 1, unit 6a, 6b), and an on site monitor in communication with the sensors (fig. 2, unit 14), and loaded with instructions to implement a method for detecting whether a rub is occurring in the turbomachine (fig. 2) between tip portions (fig. 1, unit S, shaft of the rotating component, Col. 2, Lines 5-11) of the plurality of blades (see attachment) and corresponding seal portions of the turbomachine (fig. 1, unit 4a, S, 9b, Col. 2, Lines 5-11, bearing use as seal portion).



Regarding claim 3:







Sato discloses a computer implemented method for detecting a rub (fig. 2) in a turbomachine (Col. 1, Lines 35-39), the method comprising: monitoring turbomachine conditions (fig. 2), a turbomachine comprising: a rotor (Col. 2, Lines 50), a stator (Col. 2, Lines 58), and a plurality of blades extending radially from the rotor (see attachment), or the stator (Col. 2, Lines 58), or a combination thereof (see attachment); and determining whether a rub is occurring (fig. 2) between tip portions (fig. 2, unit S, Col. 2, Lines 5-11) of the plurality of blades and corresponding seal portions of the turbomachine (fig. 1, unit S, 9b, Col. 2, Lines 5-11, bearing use as seal portion) ;and outputting an indication of the rub to a computer display (fig. 1, unit 14, fig. 2).

Regarding claim 4:

Sato discloses a storage medium encoded with a machine-readable computer program code (fig. 1, unit 13) for detecting whether a rub is occurring in a turbomachine (fig. 2, Col. 1, Lines 35-39), the storage medium including instructions for causing a computer to implement a method (fig. 1, unit 13) comprising: obtaining data indicating turbomachine conditions (fig. 2, Col. 1, Lines 35-39); wherein the turbomachine comprising: a rotor (Col. 2, Lines 50), a stator (Col. 2, Lines 58), and a plurality of blades extending radially from the rotor (see attachment), or the stator (Col. 2, Lines 58), or a combination thereof (see attachment); and determining whether a rub is occurring (fig. 2) between tip

portions (fig. 1, unit S, Col. 2, Lines 5-11) of the plurality of blades (See attachment) and corresponding seal portions of the turbomachine (fig. 1, unit 9b, 9a, S, bearing use as seal portion); and outputting an indication of the rub to a computer display (fig. 1, unit 14, fig. 2).

FIG. 2

RUBBING OUTPUT WAVEFORM	ABSENT	PRESENT
(a) AMPLIFIER		
(b) DETECTOR		
(c) VARIABLE BAND-PASS FILTER		

Regarding claim 51:

Sato discloses a system, comprising: a turbomachine (fig. 1, fig. 2, Col. 1, Lines 35-39) comprises a rotor (Col. 2, Lines 50), a stator (Col. 2, Lines 58), and a plurality of blades extending radially from the rotor (see attachment), or the stator (Col. 2, Lines 58), or a combination thereof (see attachment); means for monitoring turbomachine conditions (fig. 2), and means for detecting whether a rub is occurring in the turbomachine (fig. 2) between tip portions (fig. 1, unit S,

Col. 2, Lines 5-11) of the plurality of blades (See attachment) and corresponding seal portions of the turbomachine (fig. 1, unit 9b, 9a, S, bearing use as seal portion).

Regarding claim 52:

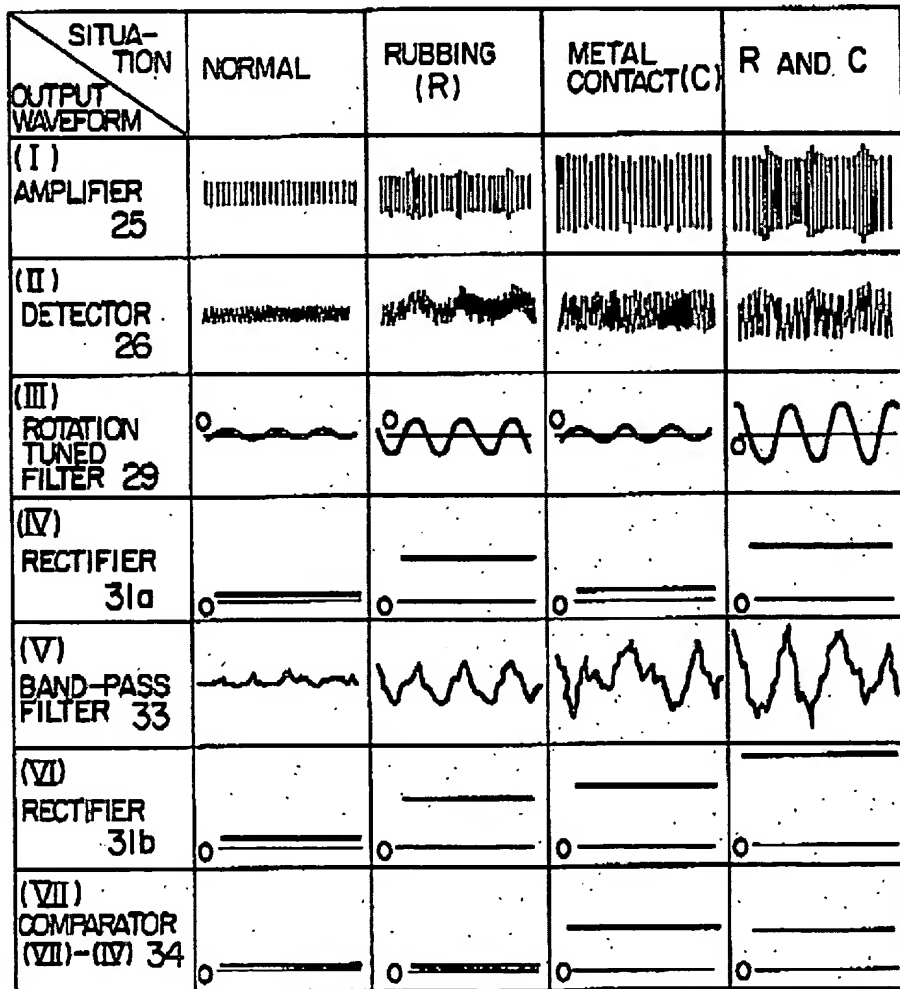
Sato discloses a system, comprising: a plurality of turbomachine Col. 1, Lines 35-39) sensors (fig. 1, unit 4a, 4b) configured to coupled to a turbomachine comprises a rotor (Col. 2, Lines 50), a stator (Col. 2, Lines 58), and a plurality of blades extending radially from the rotor (see attachment), or the stator (Col. 2, Lines 58), or a combination thereof (see attachment); wherein the plurality of turbomachine sensors is configured to sense operational parameters of the turbomachine (fig. 2); and a nub detection system configured to monitor the plurality of turbomachine sensors and to detect a turbomachine rub event (fig. 2) between tip portions (fig. 1, unit S, Col. 2, Lines 5-11) of the plurality of blades (See attachment) and corresponding seal portions of the turbomachine (fig. 1, unit 9b, 9a, S, bearing use as seal portion).

Regarding claim 54:

Sato discloses a system, comprising: a rub detection system configured to monitor operational parameters of a turbomachine comprises a rotor (Col. 2, Lines 50), a stator (Col. 2, Lines 58), and a plurality of blades extending radially from the rotor (see attachment), or the stator (Col. 2, Lines 58), or a combination thereof (see attachment); to detect a turbomachine rub event (Col. 1, Lines 35-39, fig. 2) occurring between tip portions (fig. 1, unit S, Col. 2, Lines

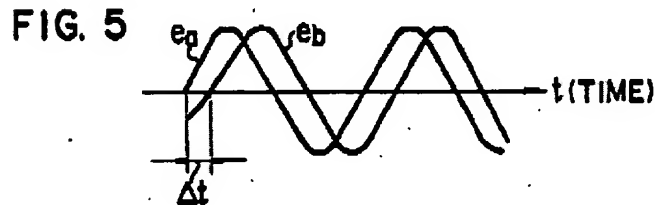
Art Unit: 2863

5-11) of the plurality of blades (See attachment) and corresponding seal portions of the turbomachine (fig. 1, unit 9b, 9a, S, bearing use as seal portion).

FIG. 9**Regarding claim 56:**

Sato discloses a computer implemented method, comprising: analyzing turbomachine operational Col. 1, Lines 35-39) data to detect a rub event in the turbomachine (fig. 2) comprises a rotor (Col. 2, Lines 50), a stator (Col. 2, Lines

58), and a plurality of blades extending radially from the rotor (see attachment), or the stator (Col. 2, Lines 58), or a combination thereof (see attachment), wherein the rub event occurs between tip portions (fig. 1, unit S, Col. 2, Lines 5-11) of the plurality of blades (See attachment) and corresponding seal portions of the turbomachine (fig. 1, unit 9b, 9a, S, bearing use as seal portion); and outputting an indication of the rub event to a computer display (fig. 1, unit 14, fig. 2).



Regarding claim 55, Sato further discloses the rub detection system is coupled to the turrbomachine (fig. 1).

Regarding claim 57, Sato further discloses monitoring a turbomachine to obtain the operational data (fig. 1, unit 6b, 6a, fig. 2).

Regarding claim 58, Sato further discloses monitoring the turbomachine on-site (fig. 1, unit 14).

Regarding claim 60, Sato further discloses monitor in real time (Col. 3, Lines 34-37, fig. 1, unit 10b. 10a, 14, fig. 2).

Regarding claim 61, Sato further discloses detect rub event in real time with operation of the machine (Col. 3, Lines 34-37, fig. 1, unit 10b. 10a, 14, fig. 2, 9).

Regarding claim 62, Sato further discloses the plurality of blades (See attachment) is disposed on the rotor (Col. 2, Lines 50, See attachment) and the corresponding seal portions are disposed on the stator (fig. 1, unit 9b, 9a, S, bearing use as seal portion).

Regarding claim 63, Sato further discloses the turbomachine conditions comprise bearing vibration (Col. 2, Lines 5-11, fig. 9, Col. 1, Lines 10-14), or temperature, or pressure, or eccentricity, or axial displacement, or load, or condenser pressure values, or any combination thereof.

Regarding claim 64, Sato further discloses the blades are disposed on the rotor (See attachment), or the stator, or any combination thereof and the seals are disposed on the rotor (fig. 1, unit S, 9b, 9a), or the stator, or any combination thereof.

Regarding claim 65, Sato further discloses the turbomachine conditions comprise bearing vibration (Col. 2, Lines 5-11, fig. 9, Col. 1, Lines 10-14), or temperature, or pressure, or any combination thereof.

Regarding claim 66, Sato further discloses the plurality of blades (See attachment) is disposed on the rotor (Col. 2, Lines 50) and the corresponding seal portions are disposed on the stator (fig. 1, unit S, 9b, Col. 2, Lines 5-11, bearing use as seal portion).

Regarding claim 67, Sato further discloses the turbomachine conditions comprise beating vibration (Col. 2, Lines 5-11, fig. 9, Col. 1, Lines 10-14), or

temperature, or axial displacement, or load, or condenser pressure values, or any combination thereof.

Regarding claim 68, Sato further discloses the plurality of blades (See attachment) is disposed on the rotor (Col. 2, Lines 50) and the corresponding seal portions are disposed on the stator (fig. 1, unit S, 9b, Col. 2, Lines 5-11, bearing use as seal portion).

Regarding claim 69, Sato further discloses the turbomachine conditions comprise temperature, or eccentricity, or load (fig. 1, unit S has a load, fig. 2), or condenser pressure values, or any combination thereof.

Regarding claim 70, Sato further discloses the plurality of blades (See attachment) is disposed on the rotor (Col. 2, Lines 50) and the corresponding seal portions are disposed on the stator (fig. 1, unit S, 9b, Col. 2, Lines 5-11, bearing use as seal portion).

Regarding claim 71, Sato further discloses the operational parameters comprise temperature, or load (fig. 1, unit S has a load, fig. 2), or condenser pressure values, or any combination thereof.

Regarding claim 72, Sato further discloses the plurality of blades (See attachment) is disposed on the rotor (Col. 2, Lines 50) and the corresponding seal portions are disposed on the stator (fig. 1, unit S, 9b, Col. 2, Lines 5-11, bearing use as seal portion).

Regarding claim 73, Sato further discloses the operational parameters

comprise eccentricity, or axial displacement, or load (fig. 1, unit S has a load, fig. 2), or condenser pressure values, or any combination thereof.

Regarding claim 74, Sato further discloses the plurality of blades (See attachment) is disposed on the rotor (Col. 2, Lines 50) and the corresponding seal portions are disposed on the stator (fig. 1, unit S, 9b, Col. 2, Lines 5-11, bearing use as seal portion).

Regarding claim 75, Sato further discloses the operational data comprises data relating to temperature (Col. 1, Lines 15-19), or pressure, or eccentricity, or any combination thereof of the turbomachine .

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

- a. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (U.S. Patent 4,478,082) in view of Turbine power systems conference (February 25-26, 2002).

Sato discloses a system including the subject matter discussed above except a server in communication with the on site monitor via an internet. Turbine power systems conference discloses a server in communication with the on site

monitor via an internet (page 12), in order to update machine data easily in a remote location with minimal staff personnel (page 14, 12, 3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify sato to have the server in communication with the on site monitor via an internet in order to update machine data easily in a remote location with minimal staff personnel.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Sato and Turbine power systems conference are analogous art because they are from the same field of endeavor, detect condition of a turbo machine.

Response to Arguments

5. Applicant's arguments with respect to the amended claims filed 02/12/2007 have been fully considered but they are not persuasive.

A. The examiner thanks the applicants for pointing out legal precedent on page 11- middle of 13.

B. Applicant argues in the arguments that the prior art does not show 'the a rub is occurring in the turbomachine between tip portions of blades and corresponding seal portions of the turbomachine' (applicants Remarks page 14, lines 7-8).

Sato discloses 'the a rub is occurring in the turbomachine between tip portions (fig. 1, unit S) of blades (See attachment) and corresponding seal portions of the turbomachine' (fig. 1, unit 9b, 9a, S, bearing use as seal portion).

Sato discloses a rub condition on the turbo shaft (fig. 1, unit S) with any other part of the turbo components or any metal contacts thereof (Col. 2, Lines 5-11), including any seal or any mechanical structure that is attach to the shaft (this case is a blade).

Seems the applicant recited some inherent features of the turbine in the claims, the examiner has provide extrinsic evidence of inherent element of a turbine (specifically with it blade) use at the time of the invention.

Reminds the applicants that to serve as an anticipation when the reference is silence about an asserted inherent characteristic, such gap in the reference may be filled with recourse to extrinsic evidence. *Continental Can Co. USA v.*

Monsanto co., 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991)

See also MPEP 2131.01, Multiple Reference 35 USC 102 Rejections.

"The inherent teaching of a prior art reference, a question of fact, arises both in the context of anticipation and obviousness." *In re Napier*, 55 F.3d 610, 613, 34

USPQ2d 1782, 1784 (Fed. Cir. 1995) (affirmed a 35 U.S.C. 103 rejection based in part on inherent disclosure in one of the references). See also *In re Grasselli*, 713 F.2d 731, 739, 218 USPQ 769, 775 (Fed. Cir. 1983) (see mpep 2111.04).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Contact information

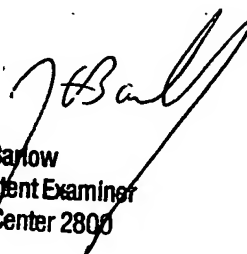
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung S Lau whose telephone number is 571-272-2274. The examiner can normally be reached on M-F 9-5:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor,

Art Unit: 2863

John Barlow can be reached on 571-272-2269. The fax phone numbers for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TL


John Barlow
Supervisory Patent Examiner
Technology Center 2800